



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

09/670,585

09/28/2000

Walter Rutten

PHD 99,142

9187

24737

7590

01/12/2005

PHILIPS INTELLECTUAL PROPERTY & STANDARDS

P.O. BOX 3001

BRIARCLIFF MANOR, NY 10510

EXAMINER

VILLECCO, JOHN M

ART UNIT

PAPER NUMBER

2612

DATE MAILED: 01/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/670,585

Applicant(s)

RUTTEN ET AL.

Examiner

John M. Villecco

Art Unit

2612

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 May 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 10 and 11 is/are rejected.
- 7) ☒ Claim(s) 6-9 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 September 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Response to Arguments

1. The examiner appreciates the applicants attempt to modify the title of the invention.

However, the amended title is still not deemed very descriptive. A new title is required that is more clearly directed towards the subject of the claims.

2. Applicant's arguments filed August 9, 2004 have been fully considered but they are not persuasive.

3. Regarding claim 1, applicant argues that Pyyhtia does not disclose that "ingoing address lines ... are selectably connected, by means of individually controllable switch elements ... and by way of a switching operation, to the respective next address line in such a manner that the sensor elements of at least two neighboring lines are activated by means of one ingoing signal."

However, as stated in the previous rejection of claim 1 and in column 7, line 48 to column 8, line 28, Pyyhtia discloses the use of flip-flops to propagate the controls signals to the respective columns. As previously stated in the previous office action, the flip-flops are interpreted to be the switching elements, since they operate to selectably apply the col_ena signal to activate desired column lines. The col_ena signal is interpreted to be the one ingoing signal. Therefore, Pyyhtia does disclose using one ingoing signal and switching elements in order to select at least two neighboring lines.

4. As for claim 2, applicant argues that Hoffman does not disclose that "the distribution of a plurality of groups of sensor elements to be read out across the overall matrix is predetermined as a binning pattern and that the binning pattern is locally variably during an exposure." Applicant

Art Unit: 2612

even points out a specific passage within Hoffman (col. 3, lines 13-20) which discloses the specific binning pattern used by Hoffman. Background regions are scanned at a lower resolution than the patient images. Thus a varying binning pattern would inherently be used. Therefore, Hoffman does disclose the use of a predetermined binning pattern that is locally variable.

5. With regard to claim 3, applicant argues that the combination of Pyyhtia and Hoffman fails to specifically disclose the ability to “intervene in the programmed execution of a binning pattern during the exposure.” It is clear from Hoffman that the ability to provide for different binning patterns is disclosed. Different binning patterns are used for the background areas and the patient areas. Pyyhtia discloses the ability to change the resolution of the device while the system is operating. When the two references are taken as a whole, one of ordinary skill in the art would have found it obvious to change the binning pattern during the operation of the system. Therefore, the combination of Pyyhtia and Hoffman does disclose intervening in the execution of the binning pattern.

6. Additionally, applicant argues that the combination of Pyyhtia, Hoffman, and Fossum is improper. However, since each of the references deals with the same problem (reading out pixels in an image sensor), one of ordinary skill in the art would have been motivated to look at these references for a solution. Therefore, the combination of references is deemed proper.

7. For the reasons stated above, the rejections from the previous office action will be repeated.

Specification

8. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: METHOD AND APPARATUS FOR IMAGING RADIATION WITH CIRCUITRY FOR READING OUT CHARGE SIGNALS OF NEIGHBORING COLUMNS AS ONE OUTPUT SIGNAL.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. **Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pyyhtia et al. (U.S. Patent No. 6,552,319) in view of Hoffman (U.S. Patent No. 6,437,338).**

11. Regarding *claim 1*, Pyyhtia discloses a method of reading out pixels in an X-ray imaging sensor in which adjacent pixels are output together. More specifically, Pyyhtia discloses detector cells (18) and circuitry for reading out the charge generated by the detector cells through signal lines (66). In Figures 6 and 7, Pyyhtia shows circuitry for reading out the signal from a 2x2 pixel block. Pyyhtia discloses that the pixels are activated by the mode and col_ena signals and that, depending on the mode, the pixels are output individually or in 2x2 pixel blocks. See column

12. 7, line 25 to column 9, line 49. The incoming address lines are connected by way of AND gate (136). The pixel charge of two neighboring columns are combined to form one output

Art Unit: 2612

signal. It is interpreted by the examiner that the flip flops (132) are interpreted to be the switching elements.

Pyyhtia however fails to explicitly disclose that each of the columns includes its own amplifier element. Hoffman, on the other hand, discloses that it is well known in the art to provide each group of reduced resolution pixels with its own column amplifiers. More specifically, for each output region a region pre-amplifier (106) is used to amplify the signals to a suitable level. Therefore, it would have been obvious to one of ordinary skill in the art to provide an amplifier element at the end of each column line so that the signal is amplified to a suitable level.

13. Regarding *claim 2*, both Pyyhtia and Hoffman disclose that the binning pattern is predetermined. Furthermore, Hoffman discloses that within each image, specific portions can be output at higher resolutions. Therefore, Hoffman teaches that the binning pattern is locally variable. See column 3, lines 13-20.

14. As for *claim 3*, Pyyhtia discloses the ability to change the resolution of the device while the system is operating. See column 10, lines 5-6.

15. **Claims 4, 5, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pyyhtia et al. (U.S. Patent No. 6,552,319) in view of Hoffman (U.S. Patent No. 6,437,338) and further in view of Fossum et al. (U.S. Patent No. 5,949,483).**

16. With regard to *claim 4*, Pyyhtia discloses a method of reading out pixels in an X-ray imaging sensor in which adjacent pixels are output together. More specifically, Pyyhtia discloses detector cells (18) and circuitry for reading out the charge generated by the detector

Art Unit: 2612

cells through signal lines (66). In Figures 6 and 7, Pyyhtia shows circuitry for reading out the signal from a 2x2 pixel block. Pyyhtia discloses that the pixels are activated by the mode and col_ena signals and that depending on the mode the pixels are output individually or in 2x2 pixel blocks. The col_ena signal is interpreted to be the activation means. See column 7, line 25 to column 9, line 49. The incoming address lines are connected by way of AND gate (136). The pixel charge of two neighboring columns are combined to form one output signal. It is interpreted by the examiner that the flip flops (132) are the switching elements.

Pyyhtia, however, fails to explicitly disclose that each of the columns includes its own amplifier element. Hoffman, on the other hand, discloses that it is well known in the art to provide each group of reduced resolution pixels with its own column amplifiers. More specifically, for each output region, a region pre-amplifier (106) is used to amplify the signals to a suitable level. Therefore, it would have been obvious to one of ordinary skill in the art to provide an amplifier element at the end of each column line so that the signal is amplified to a suitable level.

Additionally, neither Pyyhtia nor Hoffman discloses that the signal is converted into a serial signal. Fossum, however, discloses that it is well known in the art to output the signals of resolution reduced images via a serial output. Fossum discloses a multiplexer (21) for outputting the signals in a serial fashion. It is well known in the art that variable multiplexers are used to convert pixels signals to a parallel or serial form for various processing operations. Therefore, it would have been obvious to one of ordinary skill in the art to output the image signals in a serial form.

Art Unit: 2612

17. As for *claim 5*, Pyyhtia discloses that the flip flop circuits are disposed on switch lines and integrated in the sensor matrix.

18. *Claim 10* is considered substantively equivalent to claim 4 with the added limitation of the array being used in an X-ray examination apparatus which includes the image sensor. Both Pyyhtia and Hoffman disclose that the imager is used in an X-ray imaging device. Hoffman discloses the use of an x-ray source to irradiate the object with x-ray radiation.

19. **Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lauxtermann et al. (U.S. Patent No. 6,452,153) in view of Fossum et al. (U.S. Patent No. 5,949,483).**

20. Regarding *claim 11*, Lauxtermann discloses a matrix of pixel sensor elements configured in rows and columns capable of combining pixels from several columns before reading out the pixel charge. More specifically, Lauxtermann discloses a grouping of pixels (101.12, 101.11, 101.21, 101.22) which can be readout individually or as a group. Each pixel includes an electrical switch (3) for reading out charge from the photodetector (2). Each electrical switch (3) is inherently coupled to an activation means in order to read out the pixel charge. Furthermore, each pixel is connected to an output line (OUT) for each column. Lauxtermann also discloses switches (6) coupled to the activation means and the electrical switch (3), and switches (4) coupled to the switch (3). The switches are activated in concert, so that the output signal output from node (7) includes a combination of at least two neighboring readout line signals.

Lauxtermann, however, fails to specifically disclose a plurality of amplifiers coupled to each readout line or a transmission means for converting the charges into a serial signal.

Art Unit: 2612

Fossum, on the other hand, discloses that it is well known in the art to output the signals of resolution reduced images via an amplifier and a serial output. Fossum discloses a multiplexer (21) for outputting the signals in a serial fashion. Additionally, Fossum discloses that each column line includes an amplifier (722). It is well known in the art that variable multiplexers are used to convert pixels signals to a parallel or serial form and amplifier are used to enhance signals for various processing operations. Therefore, it would have been obvious to one of ordinary skill in the art to output the image signals through an amplifier and in a serial form.

Allowable Subject Matter

21. Claims 6-9 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

22. The following is a statement of reasons for the indication of allowable subject matter:

Regarding **claim 6**, the primary reason for indication of allowable subject matter is that the prior art fails to teach or reasonably suggest that the control system includes first and second shift registers for controlling the switching operations of the switch elements in order to connect each switch element to a neighboring line.

23. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

Art Unit: 2612

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any response to this final action should be mailed to:

Box AF
Commissioner of Patents and Trademarks
Washington, D.C. 20231

or faxed to:

(703) 308-6306, (for formal communications; please mark **"EXPEDITED PROCEDURE"**; for informal or draft communications, please label **"PROPOSED"** or **"DRAFT"**)

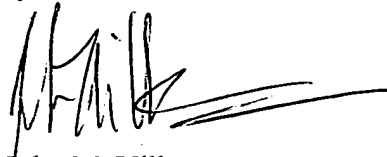
Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA., Sixth Floor (Receptionist).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John M. Villecco whose telephone number is (703) 305-1460. The examiner can normally be reached on Monday-Thursday.

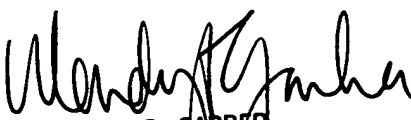
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wendy Garber can be reached on (703) 305-4929. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2612

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



John M. Villecco
January 6, 2005



WENDY R. GARBER
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER/2600